IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jiutao Li et al.

Application No.: 10/712,106 | Confirmation No.: 8216

Filed: November 14, 2003 | Art Unit: 1753

For: SILVER SELENIDE SPUTTERED FILMS AND METHOD AND APPARATUS FOR CONTROLLING DEFECT FORMATION IN SILVER SELENIDE SPUTTERED FILMS | Examiner: R. G. McDonald

REASONS SUPPORTING PRE-APPEAL BRIEF REQUEST FOR REVIEW

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

On May 28, 2008, applicants received a Final Office Action rejecting claims 1-84. Claims 85 and 86 of the application are withdrawn. On June 30, 2008, Applicants responded to the Final Office Action requesting reconsideration of the rejections. In the Advisory Action dated July 11, 2008, the examiner maintained the rejections for the reasons set forth in the Final Office Action.

The Final Office Action does not provide sufficient rationale to support the examiner's position that the present claims are obvious in view of the cited prior art. Thus, the Final Office Action fails to establish a *prima facie* case against the patentability of the claims of the above-identified application. Applicants respectfully request that the rejections be withdrawn and the pending claims be allowed over the cited prior art.

In the Final Office Action, all claims are rejected under 35 U.S.C. §103(a). Each of the rejections under 35 U.S.C. §103(a) is based on U.S. Patent No. 4,818,357 to Case et al. ("Case") in combination with U.S. Patent No. 5,534,711 to Ovshinsky et al. ("Ovshinsky"). In addition, all claims are provisionally rejected on the ground of nonstatutory obviousness-type double patenting

based on the same combination of Case and Ovshinsky. Applicants believe that the reasoning related to the obviousness of the combination of Case and Ovshinsky is in error. For clarity and brevity, Applicants will address this error primarily in the context of the 35 U.S.C. §103(a) rejection of independent claim 1. Applicants reserve the right to address other errors and other claims in any subsequent Appeal Brief.

Section 2142 of the M.P.E.P. recognizes that the "key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR International Co. v. Teleflex Inc., 550 U.S. ___, ___, 82 USPQ2d 1385, 1396 (2007) noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit." In addition, "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." M.P.E.P. § 2142. The Final Office Action does not set forth clear reasons why the present claims would have been obvious over the cited references. In addition, the Final Office Action appears to misapply the inherency doctrine and use hindsight in reaching its conclusion that the present claims are obvious in view of the cited references.

Independent claim 1 recites a method of forming silver selenide on a substrate, the method comprising, among other elements, "maintaining [the] silver selenide target at a temperature of less than about 350° C during [the] sputtering process to form a silver selenide film which comprises both alpha silver selenide and beta silver selenide." Independent claims 13, 17, 25, 28, 31, 34, 43, 45, 50, 60, 77 and 81 recite similar limitations. As explained in the specification at ¶0048, silver selenide (e.g. Ag_2Se) forms an orthorhombic structure, known as the "beta phase" at temperatures below 406 K. At temperatures above 406 K (about 133° C), Ag2Se undergoes a structural change in which the Se forms a body-centered cubic sublattice, while the Ag undergoes a melting transition. In this "alpha phase," the Ag ions exhibit liquid-like diffusion. The method of the present claims relates to the formation of silver selenide in both the alpha and beta phases.

In rejecting the independent claims, the Final Office Action relies primarily on Case, which teaches a sputtering process where the target is kept at a temperature less than 350° C. The Final Office Action notes that Case is silent about forming silver selenide and forming both the alpha and beta forms of silver selenide. In fact, Case teaches heating the substrate to 450° C +/- 20°

"to provide enough thermal activity to the deposited atoms to ensure proper interatomic bonding." Case at col. 9, lines 41-45. At this temperature it would be impossible for the silver selenide to form in the beta phase.

The Final Office Action also looks to Ovshinsky for teaching the formation of a memory device including a memory material. Ovshinsky notes that the memory material can be sputtered in a process where the substrate is at a temperature ranging from ambient temperature to 300° C. Ovshinsky at Table 2. Ovshinsky teaches that the memory material can be any number of materials, preferably including at least one chalcogen element and may include at least one transition metal element. Ovshinsky at col. 14, line 64 to col. Ovshinsky does not specifically state that silver selenide is a suitable memory material, much less that silver selenide is formed in both the alpha and beta phases.

The Final Office Action gives a broad, conclusory reason as to why the present claims are obvious and that one skilled in the art would modify Case's sputter process with Ovshinsky's general teachings. Specifically, the Final Office Action notes that the motivation for combining the references would be to make a semiconductor memory element and states: "[I]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Case et al. by utilizing the features of Ovshinsky et al. because it allows for making a semiconductor memory element." Final Office Action at 5. The same rationale is used to support all other rejections. See, Final Office Action at 8, 10, 13, 15, 17, 19, 21, 23-24, 26, 30, 33 and 34.

Clearly, this reasoning is insufficient. To reject a claim based on the teaching, suggestion or motivation test, an examiner must articulate: "(1) a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) a finding that there was reasonable expectation of success; and (3) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness." M.P.E.P. § 2143. The motivation cited by Final Office Action is irrational and the Final Office Action fails to address elements 2 and 3.

Ovshinsky teaches how to form a semiconductor memory element. If one skilled in the art wanted to make a semiconductor memory element, there would be no need to look to any other reference besides Ovshinsky. Additionally, there are countless ways to make a semiconductor memory element and countless materials that can be used to make a semiconductor memory element. The Final Office Action provides no reasoning as to why, out of all the other ways in which semiconductor memory elements can be made, one skilled in the art would be motivated to look to Case, and modify Case's process with various elements of Ovshinsky's process. The Final Office Action also offers no reasons why one skilled in the art would apply the modified process to form silver selenide, rather than any other material specifically noted by Ovshinsky or Case. Further, the Final Office Action fails to provide any reasons why one skilled in the art would be motivated to combine the references form both alpha and beta silver selenide or even that either reference recognized any benefit to forming both alpha and beta silver selenide.

The present claims would not have been obvious in view of the cited reference and there are no reasons why one skilled in the art would combine Case and Ovshinsky in the manner set forth in the Final Office Action. Instead, the Final Office Action is improperly based on hindsight and uses the present specification as a roadmap for piecing together various general teachings of the cited references. See *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 1 USPQ2d 1241, 1248 (Fed.Cir. 1986) (stating that one "cannot pick and choose among individual parts of assorted prior art references 'as a mosaic to recreate a facsimile of the claimed invention,'" citing *W.L. Gore & Assocs, Inc. v. Garlock*, 721 F.2d 1540, 1550, (Fed.Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)).

The Final Office Action also misapplies the inherency doctrine. The Final Office Action states that because Ovshinsky notes that a memory material can be sputtered onto a substrate that is at a temperature between ambient temperature to 300° C, Ovshinsky suggests forming both alpha and beta silver selenide. Final Office Action at 4. Obviousness, however, cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531 (Fed.Cir. 1993). All of the cited references are silent about alpha and beta silver selenide, none recognize any advantage of forming both alpha and beta silver selenide and the Final Office Action fails to provide any evidence that any advantage was known to those skilled in the art at the time the application was filed. Thus, the Final Office Action

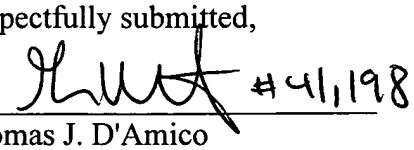
has also failed to establish the obviousness of "a silver selenide film which comprises both alpha silver selenide and beta silver selenide," as recited by claim 1 and other claims.

Moreover, Since Case's process is directed at forming homojunctions, modifying Case as suggested in the Office Action would render Case's process inoperable for its intended purpose. See M.P.E.P. § 2143.01(V), (VI) (noting that the proposed modification can not render the prior art unsatisfactory for its intended purpose or change the principle operation of the reference). Case states that the substrate is kept at 450°C +/- 20 degrees in order "to provide enough thermal activity to the deposited atoms to ensure proper interatomic bonding." Case at col. 9, lines 41-45. Modifying Case such that the substrate is between ambient temperature to 300° C as suggested in the Final Office Action would defeat the purpose of Case's process of forming homojunctions.

The Final Office Action does not provide sufficient rationale to support the examiner's position that the present claims are obvious in view of the cited prior art. Thus, the Final Office Action fails to establish a *prima facie* case against the patentability of the claims of the above-identified application. Applicants respectfully request that the rejections be withdrawn and the pending claims be allowed over the cited prior art.

Dated: August 28, 2008

Respectfully submitted,

By  #41,198

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